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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,998	12/04/2001	Werner Blohm	48619/265797	5762

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
2877	

DATE MAILED: 10/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/008,998	BLOHM ET AL.	
	Examiner	Art Unit	
	Richard A Rosenberger	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *16 July 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *25-80* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *25-80* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 25-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over French Demande de Brevet d'Invention No. 76 35004 in view of Ring et al (US 4,854,707), and further in view of Zaleski (US 5,359,418) for claims 43-62 and 74-76, further in view of Bartunek et al (US 6,346,988) for claims 63-80, and further in view of Schulz et al (US 4,676,648) for claims 34, 35, 57, 58, 72 and 73..

The French document shows measuring the diameter of an elongated, generally cylindrically-shaped article (2) comprising (a) illuminating a portion of the article using a light source that casts a beam with a non-planar wavefront onto the article; the fan-shaped beam form point light source 1 I such a beam. The system of the French document also comprises (b) receiving said nonplanar wavefront beam on light sensor arrays, the article interposed between the array and the light source so that the beam and the article create an intensity pattern as received by the arrays, the intensity pattern corresponding to a dimension of the article; the French document discloses using a CCD detector array (page 2, lines 21-33; page 3, lines 30-34; page 4, lines 26-28). The method of the French document comprises (c) obtaining from said array a plurality of signals corresponding to light intensity signals at a plurality of locations in

said intensity pattern at a plurality of locations in said intensity pattern on said array; that is, the array is read out. These steps are steps (a), (b) and (c) of all four instant independent claim with the exception that the instant claims require "a light sensor array" which receives light form both sides of the object, while the reference shows two arrays, one for each side of the object. It is known in the art that the two are equivalents, with one detector the area which does not receive light from the area around the edges is effectively wasted; note in figure 3 of Ring et al the smallest diameter measuring unit uses a single array (4a) while the larger diameter measurements use paired arrays such as is used by the French document. This demonstrates the known equivalence of the two.

The object being measured in the French document is a wire (fil), which is "an elongated article" (instant claims 31, 69). The French document discusses making a dynamic measurement (page 8, line 1) and discusses the problem of the wire vibrating during the measurement (page 6, lines 28-29), which vibration is a movement, and is the result of a movement (instant claims 37, 55 and 70).

Step (d) of claims 25 and 63, step (e) of claim 43, step (g) of claim 49 add that the edge detection is determined "in accordance with Fresnel diffraction theory, and according to the assumption that the wavefront from the light source is non-planar". The French document teaches using the position of the edge of the shadow to determine the position of the edge of the object being measured, it does not appear to teach the use of the Fresnel diffraction pattern inherent in the shadow edge to obtain high accuracy. However, it is known in the art that the inherent diffraction pattern as pick up by a

detector array can be used to increase accuracy over simply estimating the position of the transition form dark to light as the edge of the shadow. This is taught be Ring et al; see figures 2 and 4, and column 3, line 47 through column 4, line 4; note in column 3, lines 54 through 67 discusses the "theoretical diffraction image" which is "calculated", such a calculation would at least obviously include the optical geometry of the system for which the calculations would be applied. It would have been obvious to use this known method for determining edge location in the device of the French document because it is a known technique which produces accurate measurements.

Ring et al teaches that the light source produces monochromatic light (column 3, lines 14-15, claim 1, part (a)), as set forth in instant claims 33, 56 and 71.

Claim 25 adds step (e), that the geometry of the system is set so that the diffraction patterns of the two shadow edges "at most negligibly overlap"; this is also claimed as step (g) in claim 43, and claim 61. This is clearly obvious. Were the two diffraction pattern in a system that uses the pattern of the diffraction at the edges as taught by Ring et al used, it the two patterns were to overlap substantially error would be introduced since the diffraction patterns as detected would not accurately reflect the pattern of the edge. Those in the art would be foolish not to take such simple and obvious characteristics into account. Even, however, assuming that those in the art were to miss this obvious source of inaccuracy, it is clear form Ring et al, for example, that such systems can be used with a wide range of different sized articles; the diffraction pattern does not occur only with small objects; not figure 3

of Ring, which shows measurement of a wide range of diameters. Even in the absence of recognition of the possibility of interferences between the two patterns, in at least the larger of the two the patterns would, simply because of their separation in space, overlap "at most negligibly". Thus in a wide range of obvious and straightforward applications, particularly with larger diameter objects, the selection of distances between the elements would inherently, produce the claimed result.

Claim 43 adds the step of determining the distance between the article and either the light source or the detector; and this is also claimed in varying scop in claims 39-42, 59, 60, and 77-80. This is shown by the French document; light source 10, lens 11 and detector are for this purpose. Source 10 is a second light source, and detector 11 is an additional detector; the French document refers to detector 13 as a "registre photosensible" (page 6, line 37), which is the same term used for the arrays 4 and 5 (see page 4, lines 15, 16, 26, 37, for examples); it would have been obvious that detector 13 could be an array detector the same as the other detectors used in the system; it would have been obvious that detector 13 could be a second array. The second light source and second array and the beam between the is substantially perpendicular to the first beam from source 1.

Claim 43, and also claims 36-38, 49 and thus claims 50-62 through dependency, and claims 74-76, add compensating for the difference between the dimension that casts the shadow and the diameter of the article. When using a non-

planer fan-shaped beam, simple geometry determines that the measured diameter, i.e. the dimension that casts the shadow, is not the same as the diameter of the article. Zaleski shows this known fact, and discusses correcting for it is a related diameter measuring system in which the light beam is fan-shaped and not parallel. It would have been obvious to make this correction is a system such as shown by the French document because it is known to increase accuracy.

Claim 49, and thus claims 50-62 through dependency, sets forth using two generally perpendicularly disposed diameter measuring systems. The instant specification states that this is "generally known" (page 12, lines 17-19). It would have been obvious to so use two measuring systems such as shown by the French document arranges substantially perpendicularly to each other. Claims 59 and 60 add that the distance from at least on of the arrays is determined from at least one of the sets of signals form the two arrays in such a system measuring two dimensions in two directions. The system the French document determines both the diameter and the position by optically determining the position of edges of the object being measured by optical determination means disposed generally perpendicularly to each other. Duplicating the measurement path along a second direction as is generally known, it would have been obvious to use the edge determinations in on direction to determine the position in the other, as this is the general technique taught by the French document.

Claim 63, and thus claims 64-80 through dependency, adds the step of "filtering said signals . . . in order to attenuate the effects of dirt". This is known in the art; see Bartunek et al, for example, which, in an optical diameter measuring system, does this; note in particular column 6, line 66-67 and column 7, lines 3-7. It would have been obvious to use this known technique with any similar measuring system. Including systems such as in the French document.

Ring et al teaches that "[t]he diffracted image 8, especially the maxima 9, the minima 10 and the intersection points 12 are evaluated" (column 3, lines 54-56); this the references teaches using a plurality of characteristic points, including such characteristics as maxima and minima are used, and the calculations can be based on stored reference patterns (column 3, lines 56-59). Those in the art could use other convenient manners of characterizing and identifying the diffraction patterns (instant claims 26-30, 44-48, 50-54 and 64-68).

Claims 34, 35, 57, 58, 72 and 73 set forth that there is some kind of protection against contamination provided. It is known in the art to provide this; see Schulz et al; note the transparent material (screen 12) that is provided "in order to protect the transmitter and its optical element against deposit thereon" (column 5, lines 9-10); Shultz also provides a "compressed gas nozzle" (14). It would have been obvious to provide such a system in any apparatus, and in front of the receiver, in any system in which dust or dirt may be a problem.

3. The remarks filed 16 July 2002 have been considered, but have not been found to be persuasive. The expanded discussion above deals in more detail with the rational of the rejection.

The remarks argue that the Ring et al reference somehow "teaches away" form the combination. This, however, is not correct. It is true, of course, that Ring et al uses parallel rather than diverging light for the measurement, but such a different choice of construction does not constitute "teaching away"; there us nothing in Ring et al to indicate that the system will not work with a diverging beam; for instance, Ring et al doe not teach that a diverging beam would not produce the diffraction pattern. The technological arts are additive, not subtractive. Developing an improved technique for determining the position of the edges in a diameter measuring system does not remove from prior art all of the previous diameter measuring systems, nor does the disclosure of such an improved edge detection system mean that those in the art are unable to appreciate the new system and possible useful applications of the new system in related, albeit slightly different, applications. Merely making other choices does not teach or suggest that other choices cannot, or should not, be made by others. The combination of the reference is s simple, direct and straightforward application of the technique taught by the Ring et al patent in a closely related, clearly analogous apparatus the disclosed intended use of both references in the basic disclosed manner of operation of both.

4. Papers related to this application may be submitted to Group 2800 by facsimile transmission. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The fax number is (703) 308-7722.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to R. A. Rosenberger whose telephone number is (703) 308-4804.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956.

R. A. Rosenberger
20 October 2002

Richard A. Rosenberger
Primary Examiner